

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
21 June 2001 (21.06.2001)

PCT

(10) International Publication Number
WO 01/45361 A1

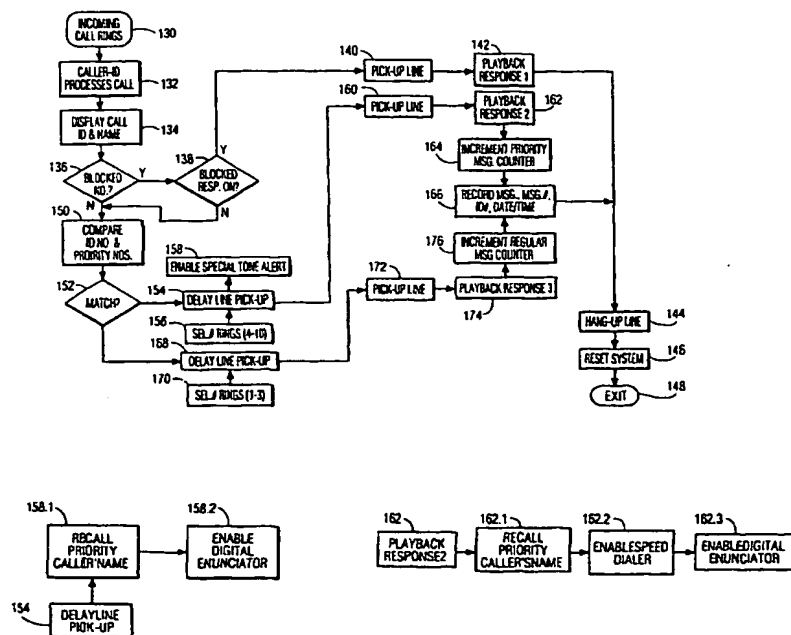
- (51) International Patent Classification⁷: H04M 1/65, 1/57 (74) Agent: DEGUELLE, Wilhelmus, H., G.; Internationaal Octrooibureau B.V., Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL).
- (21) International Application Number: PCT/EP00/12150
- (22) International Filing Date: 1 December 2000 (01.12.2000) (81) Designated States (national): CN, JP, KR.
- (25) Filing Language: English (84) Designated States (regional): European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR).
- (26) Publication Language: English
- (30) Priority Data:
09/464,864 16 December 1999 (16.12.1999) US
- (71) Applicant: KONINKLIJKE PHILIPS ELECTRONICS N.V. [NL/NL]; Groenewoudseweg 1, NL-5621 BA Eindhoven (NL).
- (72) Inventor: KAYLOR, William, R.; Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL).

Published:

- With international search report.
- Before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments.

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: TELEPHONE ANSWERING DEVICE HANDLING CALLS ACCORDING TO CALLER-ID AND PRIORITY PARTY LIST



(57) Abstract: An adaptive messaging system uses a Caller-ID device to identify (132) the telephone number of an incoming call, and compares (150) this telephone number to those in a Priority Party List. If the telephone number of the calling party is not in the Priority Party List, the system picks up (172) the call, identifies the call as a "Regular Message", records (166) the Caller-ID information and records (166) a message from the calling party. If there is a match, the system picks up (160) the call, identifies the message as a "Priority Message", records (166) the information stored in the memory, and records (166) a message from the calling party. If the Caller-ID device is unable to detect the calling party's telephone number due to the number being blocked, the system informs (142) the calling party that the user does not accept calls from parties having their telephone numbers blocked, and then terminates (144)

the call. When the user decides to play back the messages, first the system announces that Priority Messages have been received (if applicable), and then plays back the Priority Messages. After all the Priority Messages have been played back, the system of the subject invention announces that Regular Messages have been received (if applicable), and then plays back the Regular Messages.

WO 01/45361 A1

TELEPHONE ANSWERING DEVICE HANDLING CALLS ACCORDING TO CALLER-ID AND PRIORITY PARTY LIST

The subject invention relates to telephone answering systems for homes or small businesses.

5 Telephone answering systems have become common place in homes and small businesses, in which it is impractical to provide a person to answer a telephone whenever an incoming call is received. These telephone answering systems typically pick up the telephone line after a predetermined period of time (usually measured in a specific number of "rings"), and play back a pre-recorded outgoing message, after which, the system records a desired
10 message from a person placing the incoming call.

When the user of the system is available at some later time, the user then may interrogate the system in order to play back the recorded messages. However, these messages may includes, among pertinent call, those from tele-marketers, and other nuisance messages which the user must wade through in order to get to the pertinent calls.

15 Further, when a user is in the middle of some important business, the user may only want to address "important" telephone calls while allowing the system to answer and record all other calls.

U.S. Patent 5,841,838 to Itoh et al., discloses a telephone answering unit with caller identification and message recording function, in which the telephone answering unit,
20 after having received a telephone call from a particular remote telephone a predetermined number of times, records the telephone number and a voice message, if any, for future review by the user. However, the user must still wade through all of the messages to get to any pertinent messages.

25

It is an object of the subject invention to provide a system which is capable of categorizing messages from incoming call.

It is a further object of the subject invention to provide a system which is capable of alerting a user when a priority call is being received allowing the user to selectively pick up on only these calls.

These objects are achieved in an adaptive messaging system comprising a telephone interface for interfacing with a telephone network; an outgoing message recording and playback device coupled to the telephone interface; an incoming message recording and playback device coupled to the telephone interface; a Caller-ID device coupled to telephone interface for detecting a telephone number of an incoming call, and a name of a person associated to the telephone number; and a controller coupled to the Caller-ID device and the incoming and outgoing message recording and playback devices for controlling the operation of these devices, wherein said controller comprises means for storing a list of telephone numbers for which a user of the system assigns a priority; means for causing said outgoing message recording and playback device to generate a first outgoing message when said incoming call is not detected by said Caller-ID device, and for terminating said incoming call; means for comparing a telephone number of an incoming call detected by said Caller-ID device to said stored list of telephone numbers; means for causing said outgoing message recording and playback device to generate a second outgoing message when said comparing means finds said telephone number detected by said Caller-ID device in said stored list of telephone numbers, and if the user does not answer said incoming call within a first predetermined period of time, and for causing said incoming message recording and playback device to record information concerning said identified telephone number, information identifying said incoming call as a priority call, and a message from said incoming call, and for terminating said incoming call; and means for causing said outgoing message recording and playback device to generate a third outgoing message when said comparing means does not find said telephone number detected by said Caller-ID device in said stored list of telephone numbers, and if the user does not answer said incoming call within a second predetermined period of time, for causing said incoming message recording and playback device to record information concerning said incoming call, and a message from said incoming call, and for terminating said incoming call.

The subject invention makes use of a service known as caller identification (Caller-ID), described, generally, in U.S. Patent 4,582,956 to Doughty. Caller-ID provides information concerning a calling party to subscribers of the service. This information includes the telephone number of the calling party. The subject invention incorporates a Caller-ID device and a memory for storing a list of the names and telephone numbers of

particular parties, referred to herein as Priority Party List. When the Caller-ID device identifies the telephone number of an incoming call, this telephone number is compared to those in the Priority Party List. If the telephone number of the calling party is not in the Priority Party List, the system allows the user a predetermined amount of time to answer the call. After this predetermined amount of time has elapsed, the system picks up the call, identifies the call as a "Regular Message", records the Caller-ID information and records a message from the calling party. If, on the other hand, there is a match, the system of the subject invention selectively generates a special signal and allows the user an additional amount of time, over said predetermined amount of time, to answer the call. After this time has elapsed, the system picks up the call, identifies the message as a "Priority Message", records the information stored in the memory, and records a message from the calling party.

In the Caller-ID system, a calling party has the option of preventing (or blocking) data identifying his/her telephone number from being sent. If the Caller-ID device is unable to detect the calling party's telephone number due to the number being blocked, the system of the subject invention selectively informs the calling party that the user does not accept calls from parties having their telephone numbers blocked, and then terminates the call.

When the user decides to play back the messages, first the system of the subject invention announces that Priority Messages have been received (if applicable), and then plays back the Priority Messages. After all the Priority Messages have been played back, the system of the subject invention announces that Regular Messages have been received (if applicable), and then plays back the Regular Messages.

With the above and additional objects and advantages in mind as will hereinafter appear, the invention will be described with reference to the accompanying drawings, in which:

Fig. 1 is a block diagram of the system in accordance with the invention;
Fig. 2 is a block diagram showing the controller of the system of Fig. 1;
Fig. 3 is a flowchart showing the storing and erasing of Priority Party data into and from the memory of the system;]

Fig. 4A is a flowchart showing the operation of receiving messages using the system of the invention, while Figs. 4B and 4C show modifications of the flowchart of Fig. 4A; and

Fig. 5 is a flowchart showing the operation of retrieving messages using the system of the invention.

5 Fig. 1 shows a block diagram of the adaptive messaging system of the subject invention. A telephone 10 is shown connected to a public telephone connection 12. The adaptive messaging system includes an telephone interface 14 connected to the public telephone connection 12. An outgoing message recording and playback device 16 and an incoming message recording and playback device 18 are shown connected to the telephone interface 14. A microphone 20 is connected to the outgoing message recording and playback device 16 for recording outgoing messages. The adaptive messaging system further includes and audio amplifier 22 and a loudspeaker 24 connected to outputs of the outgoing and incoming message recording and playback devices 16 and 18 for audibly playing back for a user the messages on the respective devices 16 and 18. A controller 26 is connected via control lines 28 and 30 to the outgoing and incoming message recording and playback devices 16 and 18, and via signal line 32 to the incoming message recording and playback device 18. A signal line 34 connects an audio output from the controller 26 to the audio amplifier 22.

20 A Caller-ID device 36 is connected to the telephone interface 14 and is connected to a display 38 as well as to the controller 26, which also has a signal line 40 connected to the display 38.

The adaptive messaging system further includes a speed dialer 42 connected to the telephone interface 14 as well as to the telephone 10, and receives control signals from the controller 26 over line 44 and data signals through line 46. Finally, the adaptive messaging system includes a priority message counter 48 and a regular message counter 50 connected to the controller 26, and a memory 52, which may be an EPROM, also connected to the controller 26.

30 Fig. 2 shows a block diagram of the controller 26 which includes a microprocessor 60 and an interface 62 connected by a control signal bus 64 and a data bus 66. The interface 62 connects the microprocessor 60 to the components shown in Fig. 1 connected to the controller 26 using control signal bus 68 and data bus 70. An ROM memory 72 is shown connected to the microprocessor 60 and contains the operating program for the adaptive messaging system, while a RAM memory 74 is connected to the microprocessor 60 for temporarily storing signals. A tone generator 76 is shown connected to a signal output

from the microprocessor 60, and is connected to the audio amplifier 22 of Fig. 1 via the signal line 34. The memory 52 of Fig. 1 is shown as an EPROM, which is connected to the microprocessor 60. In addition, a keyboard 78 is shown connected to the microprocessor 60 for allowing the user to enter of instructions and data. Finally, a digital enunciator 80 is
5 shown connected to the microprocessor 60 for sending a digitally generated voice signal alternatively to the audio amplifier 22 or to the speed dialer 42.

Prior to using the system of the subject invention, a user needs to identify to the system the names and telephone numbers of those persons that the user regards as his/her Priority Party List. Fig. 3 shows a flowchart of a method describing this process. It should be
10 understood that this method is only one of many methods which can be used to set up the system. Upon pressing a set-up button on the keyboard 78, the set-up procedure is initiated in the microprocessor 60 (step 100). At step 102, the microprocessor 60 displays the message "ENTER? or REMOVE?" on the display 38. At step 104, the microprocessor 60 determines whether the ENTER key on the keyboard 78 has been pressed. If so, at step 106, the
15 microprocessor 60 displays the message "ENTER PRIORITY PARTY NAME & NUMBER". At step 108, the microprocessor 60 stores in the EPROM memory 52 the name and telephone number entered by the user. The microprocessor 60 then displays the message "ANOTHER PRIORITY PARTY?" at step 110. If the user presses the YES button on the keyboard 78, at step 112, the program goes back to step 106 prompting the user to enter
20 another priority party name and number. If, at step 112, the user presses the No button on the keyboard 78, the program is exited at step 114. If, instead, the user desires to erase a Priority Party, at step 102, the user presses the "REMOVE" button on the keyboard 78 which is detected in step 116. At step 118, the microprocessor 60 displays the message "ENTER PRIORITY PARTY NAME & NUMBER", and, in response to the user performing this task
25 using the keyboard 78, at step 120, the microprocessor 60 erases the appropriate data from the EPROM 52 and then prompts the user with the message "ANOTHER PRIORITY PARTY?" at step 122. At step 124, if the user presses the YES button on the keyboard 78, the program goes back to step 118 prompting the user to enter another priority party name and number. If, at step 124, the user presses the NO button on the keyboard 78, the program exits
30 at step 114.

Fig. 4 shows a flowchart of the operation of the system when a call is received. At step 130, the system receives a call over the public switched telephone network 12. The Caller-ID device 36 processes the call at step 132 and, at step 134, displays the calling party's number and name. At step 136, the Caller-ID device 36 determines whether the calling

party's number is blocked. If so, at step 138, the controller 26 determines whether the user has activated the "Blocked response". If so, the controller 26 picks up the call at step 140 and, at step 142, activates the outgoing message record and playback device 16 to play back Response 1 which may be "WE DO NOT ACCEPT CALLER-ID BLOCKED CALLS.

5 PLEASE UNBLOCK YOUR TELEPHONE AND CALL BACK". At step 144, the controller 26 terminates the call, resets the system at step 146, and exits the program at step 148.

If, at step 136, the Caller-ID device 36 determines that the calling party's number is not blocked, or at step 138, the controller 26 determines that the "Blocked response" has not been activated, the controller 26 then compares, at step 150, the Caller-ID
10 number with those stored in the memory 52. At step 152, if there is a match, the controller 26, at step 154 delays picking up the line for a first predetermined period of time (selectable by the number of rings between 4 and 10 rings (step 156)), and, at the same time, enables a special tone alert, at step 158, via the tone generator 76, the audio amplifier 22 and the loudspeaker 24, signifying to the user that the call is from a Priority Party and allowing
15 additional time for the user to pick up the call using the telephone 10. Alternatively, as shown in Fig. 4B, at step 156.1, the controller 26 retrieves the name of the Priority Party from the Priority Party List stored in memory 52 and, at step 158.2, applies a signal to the digital enunciator 80 which then enables the system to announce the Priority Party's name using the audio amplifier 22 and the loudspeaker 24. If the user does not pick up the call within the
20 first predetermined period of time, at step 160, the controller 26 answers the call and enables the outgoing message record and playback device 16 to play back Response 2 at step 162, which may refer the caller to a second telephone number where the user could be reached or advise when the user expects to be at home and available to receive calls. This Response 2 would only be played to a Priority Party as determined by the Priority Party List stored in the
25 memory 52. At step 164, the controller 26 increments the Priority Message counter 48 and, at step 166, controls the incoming message record and playback device 18 to record a message from the calling party, the Priority Message counter number, the name/number of the calling party, and the date and time of the message. The system then goes to steps 144, 146 and 168, where the system hangs up the line, resets and exits the program.

30 As an alternative, as shown in Fig. 4C, when Response 2 is played back at step 162, the controller 26 also recalls the name of the Priority Party at step 162.1. At step 162.2, the controller 26 enables the speed dialer 42 to dial an alternate number for the user of the system (e.g., the user's cellular telephone number) and, when the user answers the call, the

controller 26 enables the digital enunciator 80 to announce the name of the calling Priority Party (step 162.3).

If, at step 152, the controller 26 does not find a match with the Priority Party List stored in the memory 52, at step 168, the controller 26 delays picking up the line for a second predetermined period of time (selectable by the number of rings between 1 and 3 rings (step 170)). If the user does not pick up the call within the second predetermined period of time, at step 172, the controller 26 picks up the line and, at step 174, causes the outgoing message record and playback device 16 to play back Response 3 which may be a standard response indicating that the user is not available and requesting that the calling party leave a message. The controller 26 then increments the Regular Message counter 50 at step 176, and, at step 166, activates the incoming message record and playback device 18 to record a message from the calling party, the message number from the Regular Message counter 50, the Caller-ID number of the calling party, and the date and time of the message. The system then proceeds to steps 144, 146 and 148 as described above.

Fig. 5 is a flowchart showing how the system of the subject invention plays back messages. At step 180, the user presses a "PLAY MESSAGES" button on the keyboard 78. At step 182, the controller 26 checks counters 48 and 50 to determine whether any messages have been received. If not, at step 184, the controller 26 causes the message "NO MESSAGES" to be played back by the audio amplifier 22 and the loudspeaker 24. The system is then reset at step 186 and the program exits at step 188.

If, at step 182, the controller 26 determines that there are messages, at step 190, the controller 26 determines whether the messages include Priority Messages by examining the Priority Message counter 48. If so, at step 192, the message number, the telephone number, the name of the calling party and the date and time are retrieved from the incoming message record and playback device 18 and are displayed by the controller 26 on the display 38. At the same time, at step 194, the controller 26 plays the message "PRIORITY MESSAGE" using the audio amplifier 22 and the loudspeaker 24, and then, at step 196, causes the incoming message record and playback device 18 to play back the message through the audio amplifier 22 and the loudspeaker 24. At step 198, the controller 26 then determines whether the user wants the call to be returned by the user using the keyboard 78. If not, at step 200, the controller 26 decrements the Priority Message counter 48 and then determines whether this is the last Priority Message at step 202. If not, the program reverts to step 192. If this is the last Priority Message, then, at step 204, the controller 26 determines if there are any Regular Messages by interrogating the Regular Message counter

50. If not, at step 206, the controller 26 issues the message "NO MORE MESSAGES" via the audio amplifier 22 and the loudspeaker 24, and then the system reverts to step 186.

If, at step 198, the user wishes to return the call, at step 208, the controller 26 suspends playback of messages by the incoming message record and playback device 18 and, at step 210, sends the Caller-ID telephone number to the speed dialer 42. At step 212, the speed dialer 42 dials the telephone number, and, at step 214, the controller 26 determines whether the call is answered. If not, the program reverts to step 200. If so, the controller 26 then, at step 216, determines whether the user has ended the call and waits until the call ends. The program then reverts to step 200.

10 If, at step 190, the controller 26 determines that there are no Priority Messages by interrogating the Priority Message counter 48, the controller 26 then, at step 218, plays the message "NO PRIORITY MESSAGES" via the audio amplifier 22 and the loudspeaker 24, and then, at step 220, plays the message "REGULAR MESSAGES". At step 222, the controller 26 causes the incoming message record and playback device 18 to play back the first Regular Message, along with displaying, on the display 38, the Regular Message number from the counter 50, the Caller-ID telephone number, and the date and time of the message. At step 224, the controller 26 determines whether the user wants to return the call. If not, the controller 26 decrements the counter 50 at step 226, and, at step 228, the controller 26 determines whether this was the last Regular Message using the Regular Message counter 50. If not, the program reverts to step 220. If so, the program reverts to step 204.

25 Finally, if the user decides to return the call at step 224, at step 230, the controller 26 suspends the playback by the incoming message record and playback device 18 and, at step 232, supplies the Caller-ID telephone number to the speed dialer 42. At step 234, the speed dialer 42 dials the telephone number and, at step 236, the controller 26 determines whether the call has been answered. If not, the program reverts to step 226. If so, at step 238, the controller 26 waits until the user has terminated the call. Then the program reverts to step 226.

30 While not shown in the figures, it should be noted that the system allows the user to (1) save all the message for later review, (2) delete all of the retrieved messages, or (3) delete all of the messages.

Numerous alterations and modifications of the structure herein disclosed will present themselves to those skilled in the art. However, it is to be understood that the above described embodiment is for purposes of illustration only and not to be construed as a

limitation of the invention. All such modifications which do not depart from the spirit of the invention are intended to be included within the scope of the appended claims.

CLAIMS:

1. An adaptive messaging system comprising:
 - a telephone interface (14) for interfacing with a telephone network (12);
 - an outgoing message recording and playback device (16) coupled to the telephone interface (14);
 - 5 an incoming message recording and playback device (18) coupled to the telephone interface (14);
 - a Caller-ID device (36) coupled to telephone interface (14) for detecting a telephone number of an incoming call, and a name of a person associated to the telephone number; and
 - 10 a controller (26) coupled to the Caller-ID device (36) and the incoming and outgoing message recording and playback devices (16, 18) for controlling the operation of these devices, wherein said controller comprises:
 - means (52) for storing a list of telephone numbers for which a user of the system assigns a priority;
 - 15 means (60) for comparing a telephone number of an incoming call detected by said Caller-ID device (36) to said stored list of telephone numbers (52);
 - means (60) for causing said outgoing message recording and playback device (16) to generate an outgoing message when said comparing means (60) finds said telephone number detected by said Caller-ID device (36) in said stored list of telephone numbers (52),
 - 20 and, if the user does not answer said incoming call within a first predetermined period of time, for causing said incoming message recording and playback device (18) to record information concerning said identified telephone number, information identifying said incoming call as a priority call, and a message from said incoming call, and for terminating said incoming call; and
 - 25 means (60) for causing said outgoing message recording and playback device (16) to generate said outgoing message when said comparing means (60) does not find said telephone number detected by said Caller-ID device (36) in said stored list of telephone numbers (52), and if the user does not answer said incoming call within a second predetermined period of time, for causing said incoming message recording and playback

device (18) to record information concerning said incoming call, and a message from said incoming call, and for terminating said incoming call.

2. The adaptive messaging system as claimed in claim 1, wherein said controller
5 (26) further comprises:

means (76) for generating an alert signal for the user when said comparing means finds said telephone number detected by said Caller-ID device (36) in said stored list of telephone numbers (52).

- 10 3. The adaptive messaging system as claimed in claim 2, wherein said storing means (52) further contains names of callers associated, respectively, with said list of telephone numbers, and said alert signal generating means (76) comprises:

a digital enunciator (80) for generating a vocal message for the user, said controller (26) recalling the name of a caller associated with the telephone number detected
15 by said Caller-ID device (36), and applying the caller's name to the digital enunciator (80).

4. The adaptive messaging system as claimed in claim 1, wherein said system is adapted to play back recorded messages, said system further comprising:

means (48, 50, 60) for checking whether any messages have been stored by
20 said incoming message recording and playback device;

means (80) for generating a first user message when no messages are detected by said checking means;

means (80) for generating a second user message when at least one of the stored messages contains information identifying said incoming call as a priority call;

25 means (60) for causing said incoming message recording and playback device (18) to play back each of said messages containing said information identifying said incoming call as a priority call;

means (60, 80) for generating a third user message when any remaining calls do not have said information identifying said incoming call as a priority call; and

30 means (60) for causing said incoming message recording and playback device (18) to play back each of said messages not containing said priority call identifying information.

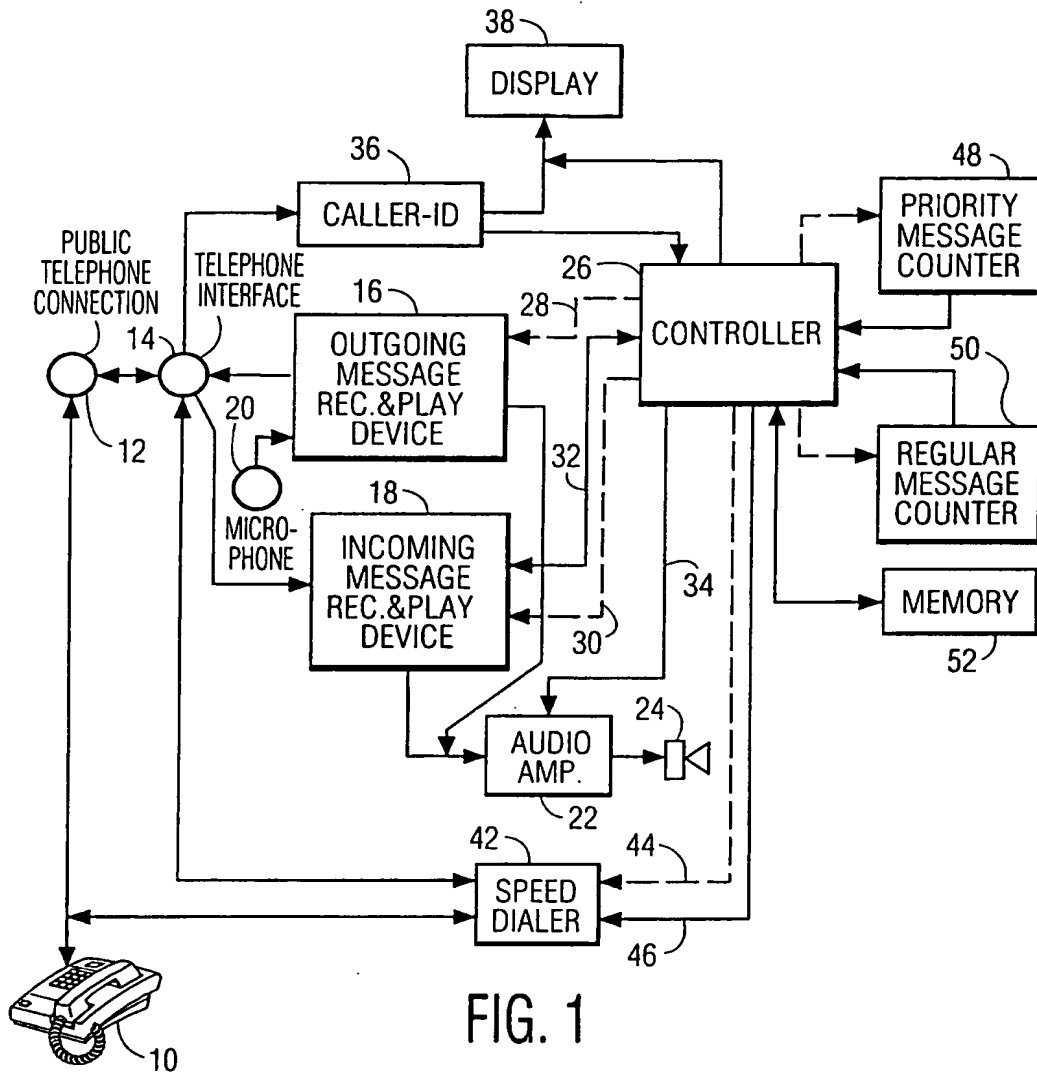
5. The adaptive messaging system as claimed in claim 4, wherein said second user message is generated (60, 80) prior to the playing back of each of said messages containing said priority call identifying information.

5 6. The adaptive messaging system as claimed in claim 4, wherein said third user message is generated (60, 80) prior to the playing back of each of said messages not containing said priority call identifying information.

7. The adaptive messaging system as claimed in claim 1, wherein said adaptive
10 messaging system further comprises:
means (60) for causing said outgoing message recording and playback device (16) to generate a further outgoing message when said incoming call is not detected by said Caller-ID device (36), and for terminating said incoming call.

15 8. The adaptive messaging system as claimed in claim 1, wherein said outgoing message recording and playback device (16) generates a first outgoing message when said comparing means (60) finds said telephone number detected by said Caller-ID device (36) in said stored list of telephone numbers (52), and generates a second outgoing message,
different from said first outgoing message, when said comparing means (60) does not find
20 said telephone number detected by said Caller-ID device (36) in said stored list of telephone numbers (52).

1/6



2/6

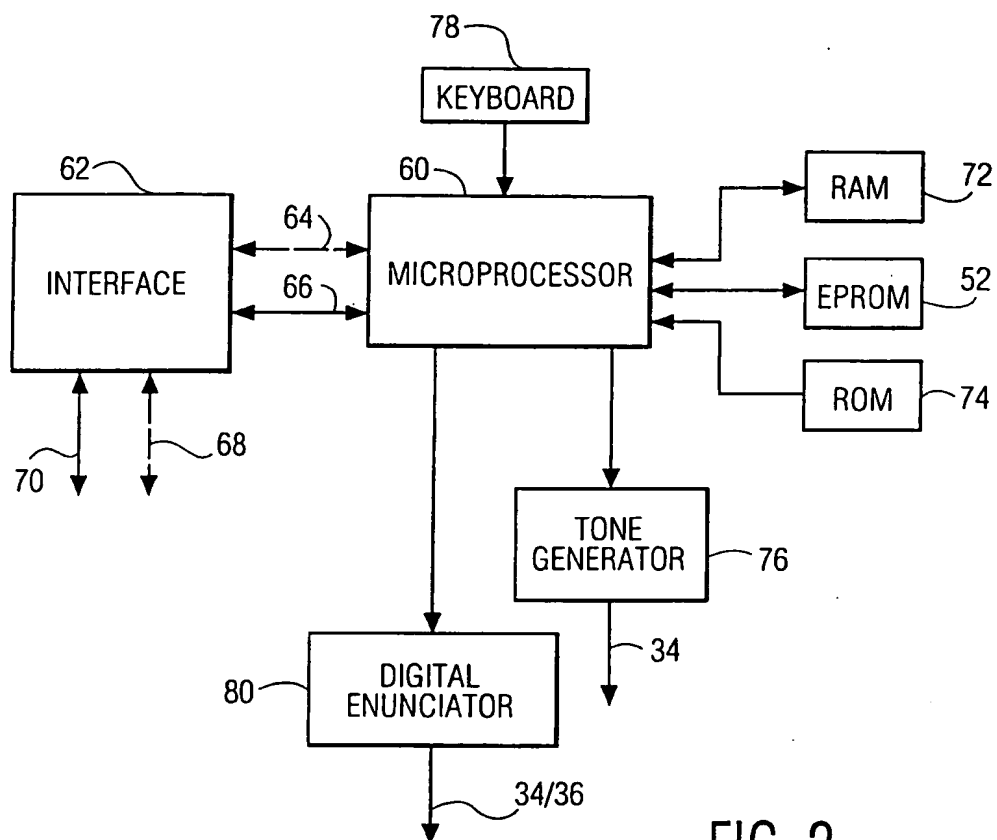


FIG. 2

3/6

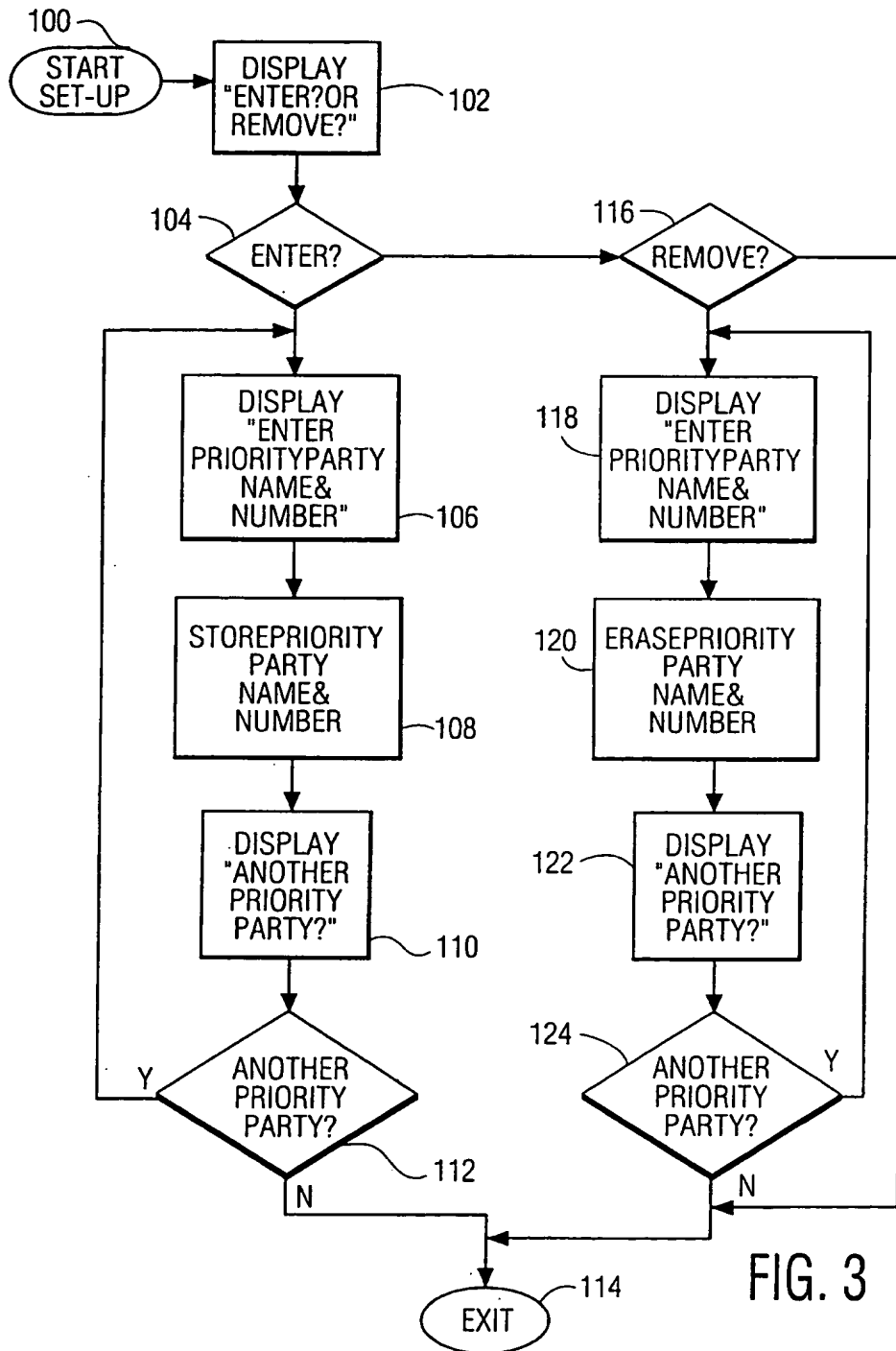


FIG. 3

5/6

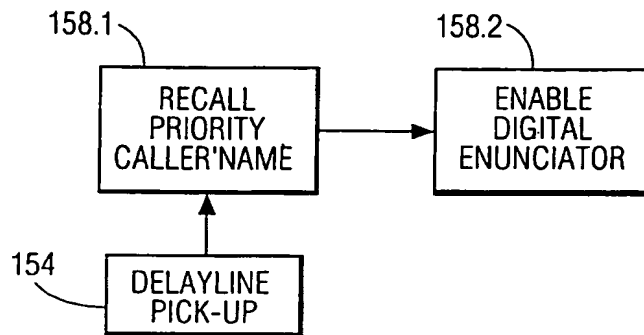


FIG. 4B

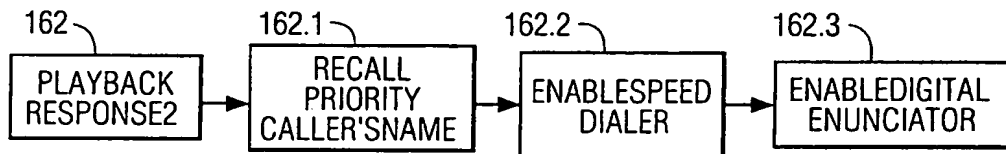
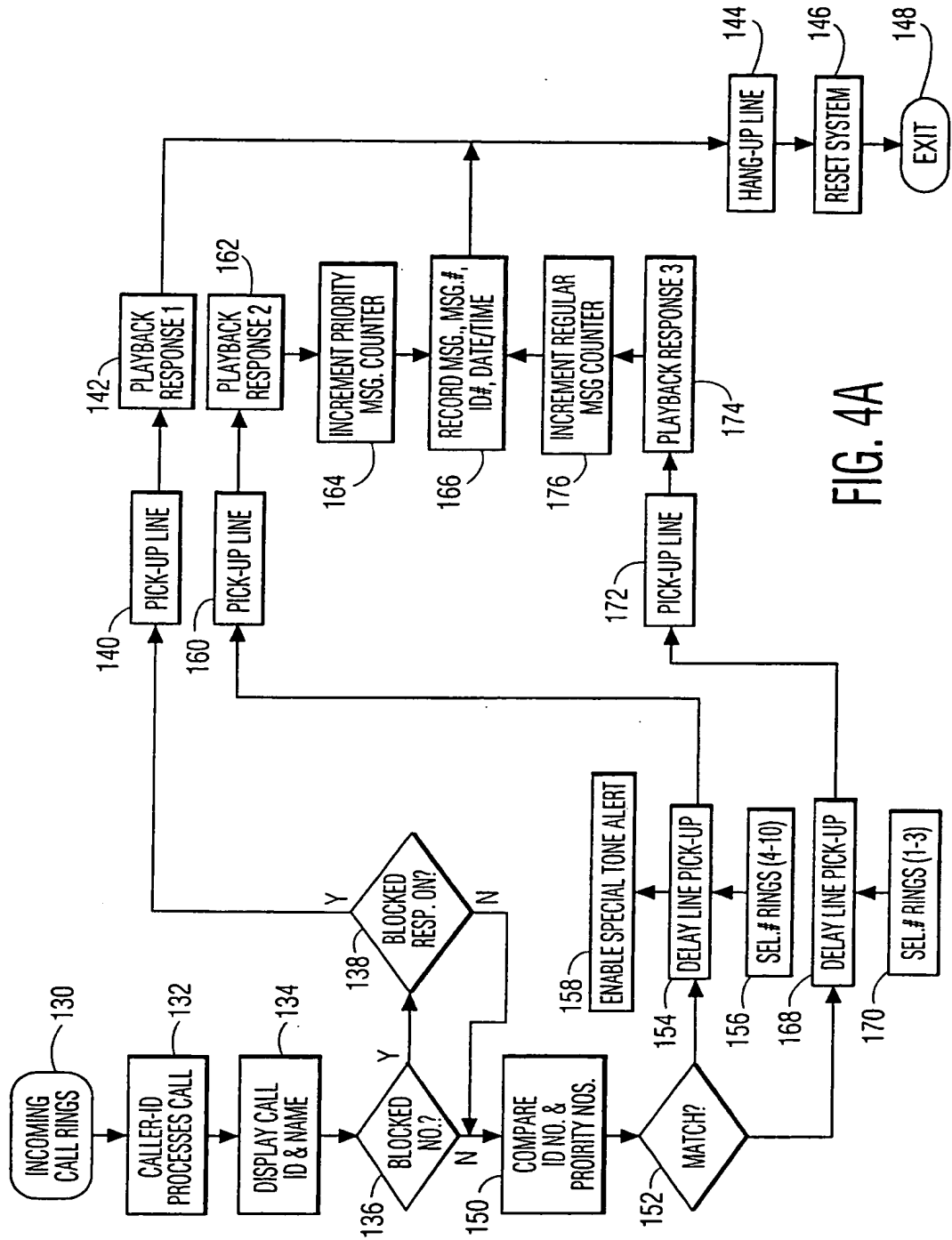


FIG. 4C



6/6

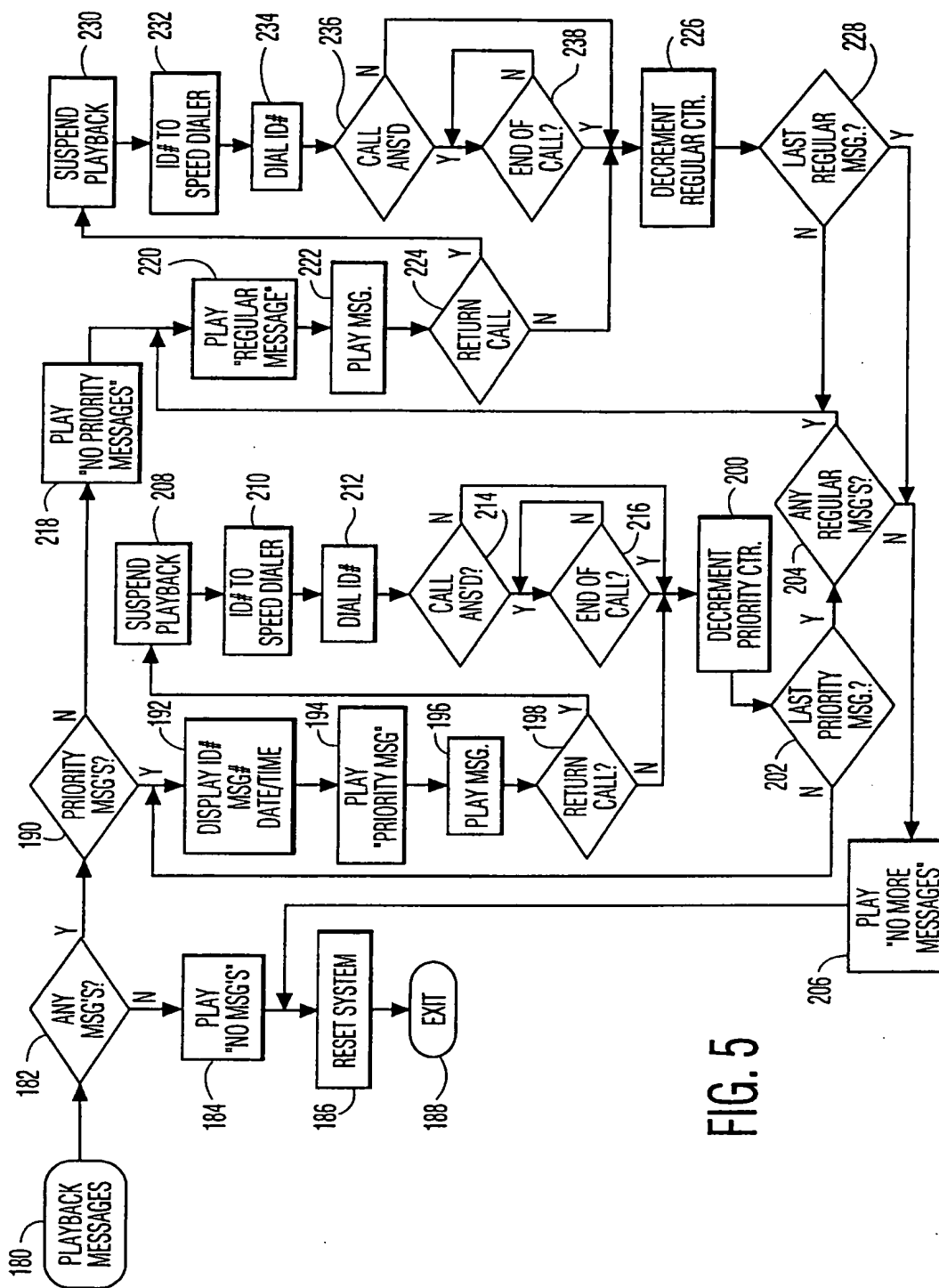


Fig. 5

INTERNATIONAL SEARCH REPORT

b. National Application No
PCT/EP 00/12150

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H04M1/65 H04M1/57

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 H04M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 946 032 A (LUCENT TECHNOLOGIES INC) 29 September 1999 (1999-09-29) paragraph '0034! - paragraph '0039! paragraph '0058!	1,4-6
Y	-----	2,3,7,8
Y	US 5 781 613 A (KNUTH STEPHEN B ET AL) 14 July 1998 (1998-07-14) column 1, line 56-67	7
Y	-----	8
Y	EP 0 957 622 A (LUCENT TECHNOLOGIES INC) 17 November 1999 (1999-11-17) abstract	2,3
Y	-----	
Y	EP 0 895 392 A (BOSCH GMBH ROBERT) 3 February 1999 (1999-02-03) claims 1-3	

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *&* document member of the same patent family

Date of the actual completion of the international search

7 May 2001

Date of mailing of the international search report

17/05/2001

Name and mailing address of the ISA
European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax (+31-70) 340-3016

Authorized officer

Cremer, J

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/EP 00/12150

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0946032 A	29-09-1999	JP 11331361 A TW 404102 B	30-11-1999 01-09-2000
US 5781613 A	14-07-1998	GB 2314482 A,B	24-12-1997
EP 0957622 A	17-11-1999	JP 11355431 A TW 404108 B	24-12-1999 01-09-2000
EP 0895392 A	03-02-1999	DE 19733050 A	04-02-1999